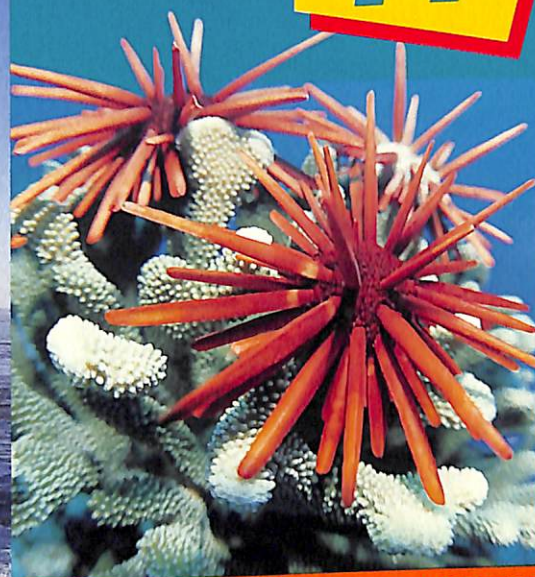


QUEST

ADVENTURES IN THE WORLD OF SCIENCE

THE SEAS

47



SCIENTIFIC PROJECTS

FACT FILES ON:

- ▶ The frozen poles
- ▶ Racing yachts
- ▶ Seabeds
- ▶ Ports and harbours
- ▶ Building giant ships
- ▶ Coastlines
- ▶ Seas on other planets



MODEL: A SUBMERSIBLE

GIANT OFFSHORE POWER BOAT POSTER

INSIDE THIS PACK

FACT FILES

- Frozen seas ► How coastlines are created
- Mining the seabed
- Assembling a supertanker
- Handling cargo ► Seas on other worlds ► Designing a race-winning yacht



MODEL Deep sea submersible

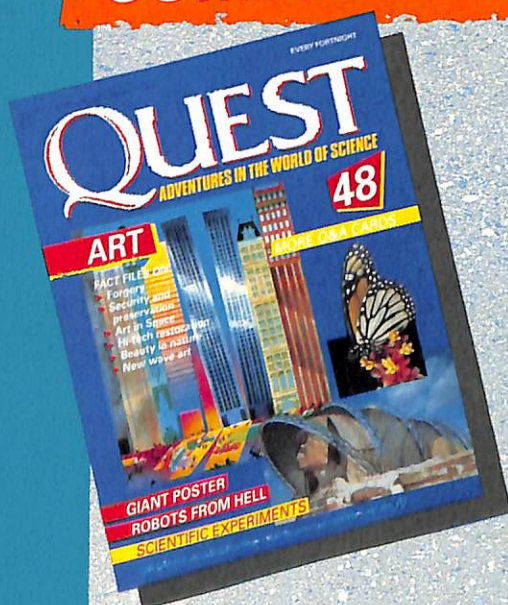


POSTER
King of the waves

**THREE
PROJECTS**



COMING IN QUEST 48 ART



FACT FILES INCLUDE:

- Detecting fakes
- New art
- Natural beauty
- Restoration
- Protection and theft
- Art in Space



PLUS More In-Quest Q&A cards



POSTER
Robots from hell

ISSN 1350-3766



One of Britain's top class offshore power boats, the *Follett* is capable of cruising at 144 km/h and during a race will average speeds of 137 km/h. Its cast aluminium hull is 12.5 metres long by 2.5 metres wide and has a built-in tank which holds 1,364 litres of fuel. Two turbo diesel engines power the craft with a total output of 1,650 horsepower.

Three crew members handle the boat during a race and each is assigned a vital role. The person responsible for steering the craft stands at the front in the centre. Steering is power-assisted on the *Follett*—she weighs a hefty 6 tonnes when fully fuelled.

To the left, a second crew member controls the speed and attitude (angle) at which the boat travels. Unlike many smaller boats where the throttle and

steering are in the hands of one person, the high speeds of Class One power boat racing are such that precision is imperative and for safety and efficiency the job is handled by two people. Small trim tabs, similar to those found on aeroplanes, are positioned at the rear of the boat and govern the angle at which the boat hits the water. This is varied according to the speed of the boat and water conditions.

Before the start of any event the course is plotted by the navigator. During the race he stands to the right of the deck and uses a compass and stopwatch to give accurate steering directions. The fourth person is a passenger, usually a personality (in this case the crown prince of Jordan) or a member of the media invited to take part by the rest of the team.

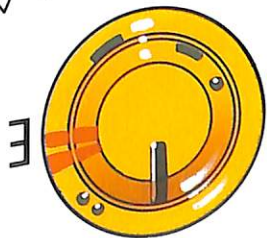
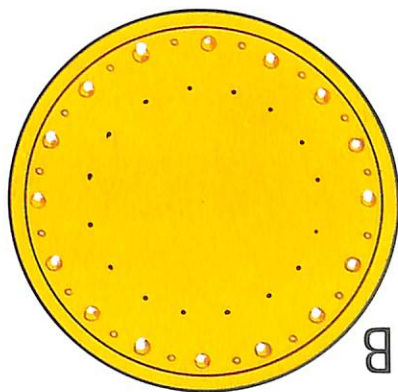
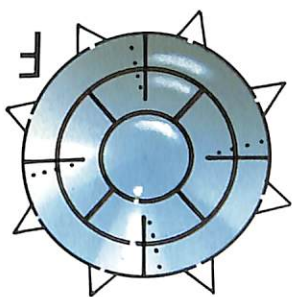
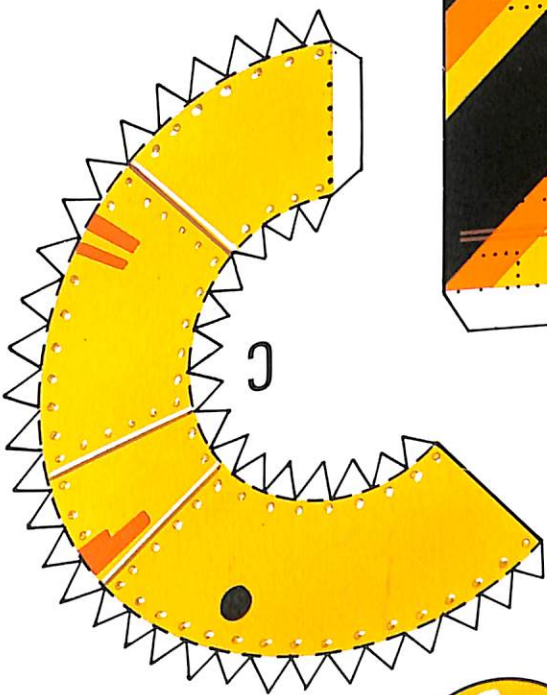
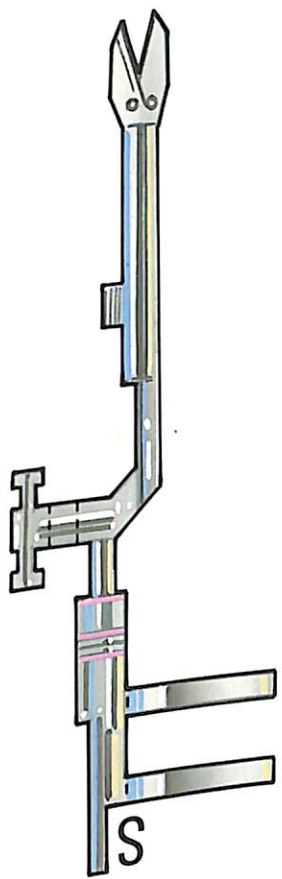
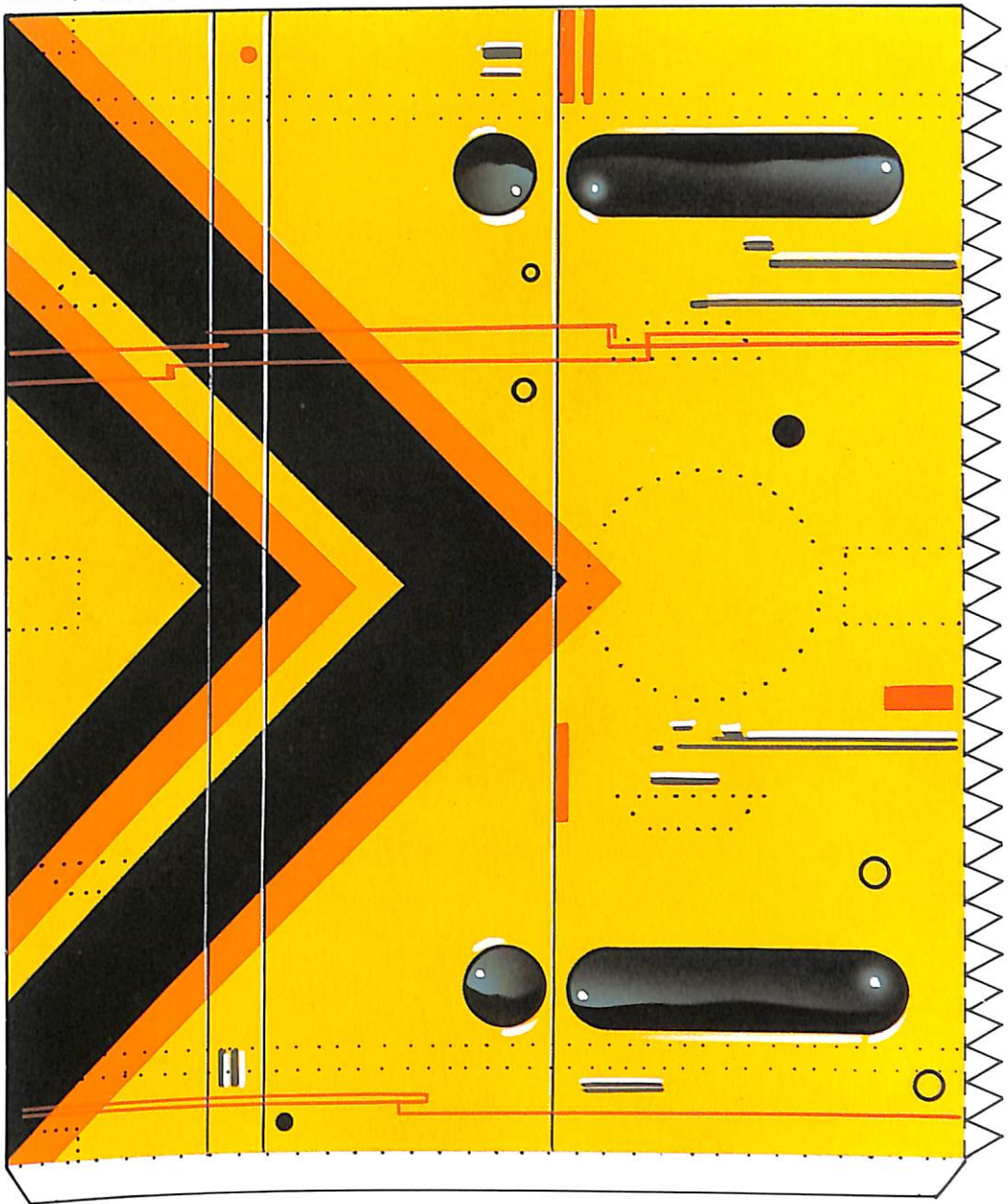
Colin Taylor Productions

The Follett is a Class One power boat. It cost around £200,000 to build and then a further £100,000 to run through the four-month racing season. The engine is serviced after every race and has to be totally rebuilt after every three races.

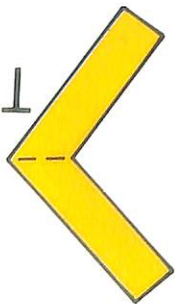
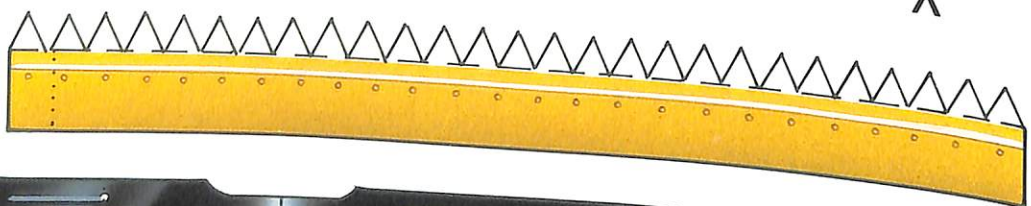
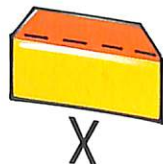
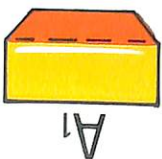
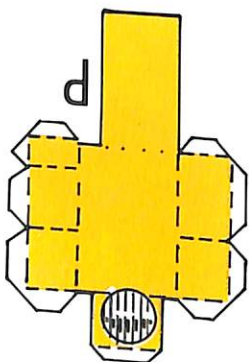
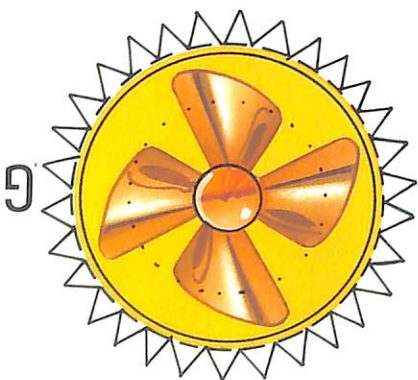
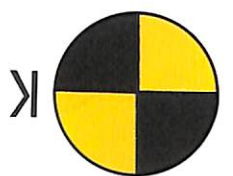
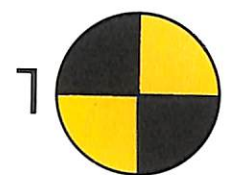
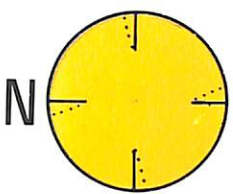
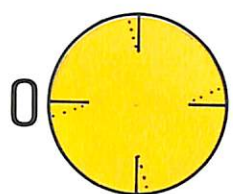
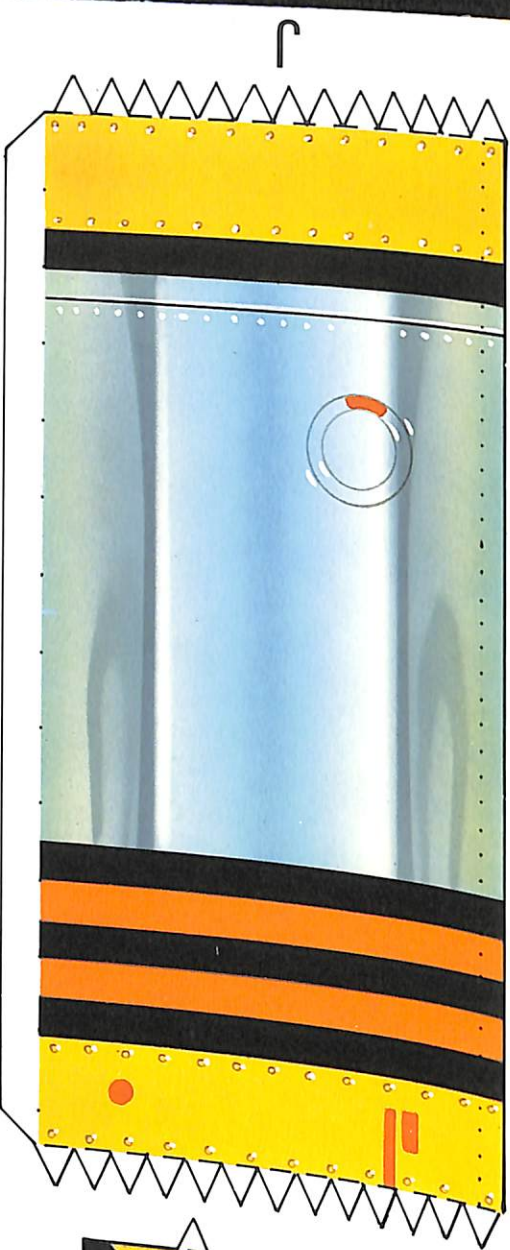
KING OF THE

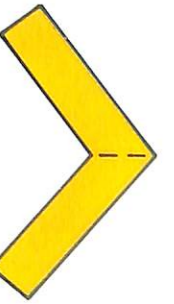
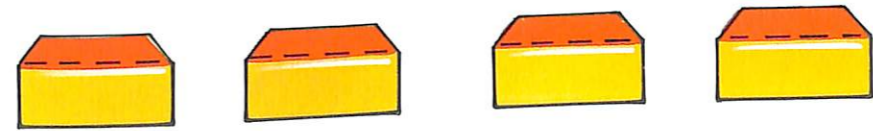
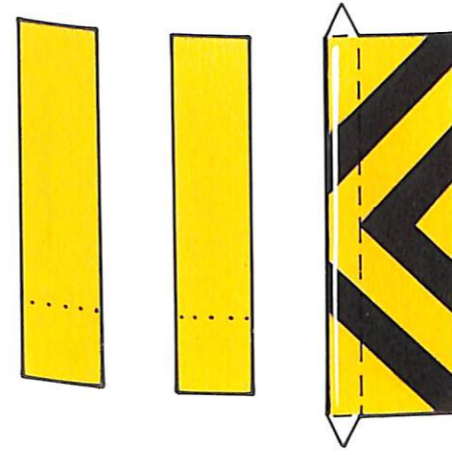
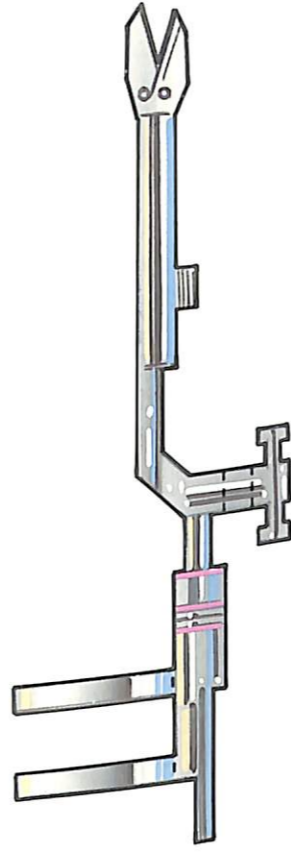
SUBMERSIBLE

James Nevill 3D/Joel Lawrence



© Marshall Cavendish Ltd. 1990/95







MODEL

ASSEMBLY INSTRUCTIONS

1 2 3 4 5

You will need

Scissors • Ruler • Craft knife • Glue

Before cutting out the pieces, score along all broken lines with a blunt edge and ruler to make folding and gluing easier. Study the ASSEMBLY DIAGRAM to see how the pieces fit together, and use the dotted lines as a guide for positioning.

NB Younger children will need supervision when using a craft knife.

To make up

Main body of submersible

1 Cut out main body section **A**, fold down the tabs and then glue into tube shape.

2 Cut out **B** and stick onto the tabs at rear end of **A**.

3 Cut out **C**, fold down tabs and glue into cone shape, following positioning marks. Spread glue on to tabs at wider end of cone and ease this into front end of **A** so cone protrudes from main body.

4 Cut out entry hatch parts **D** and **E**. Fold down tabs on **D** and glue into tube shape. Apply glue to 19 tabs at flat end of **D** and stick **E** on to these to make lid.

5 Spread glue over seven tabs on the underside of **D** and stick to **A**, following positioning marks. For best fit, make sure join in **D** is towards the side of **A**.



6 Cut out observation port **F**, cutting along dark lines towards centre. Fold down tabs. Spread glue between slit and positioning marks, then fold each slit so that it meets the mark underneath and stick down. This should make a slight cone shape. Glue tabs on **F** to **B**, following positioning marks.

Battery compartments

1 Cut out left-hand side battery components **J**, **K** and **L**. Fold down tabs on **J** and glue into tube shape. Stick **K** on to tabs at end with only one black stripe – the rear end. Cut slits in **L** and glue on to positioning marks to form flattened cone (as with **F**). Glue **L** on to tabs on open end of **J**.

2 Repeat with right-hand side battery components **M**, **N** and **O**.

3 Following positioning marks on both batteries and main body, glue **J** to left side of **A** and **M** to right side (SEE ASSEMBLY DIAGRAM).

Extra parts of main body

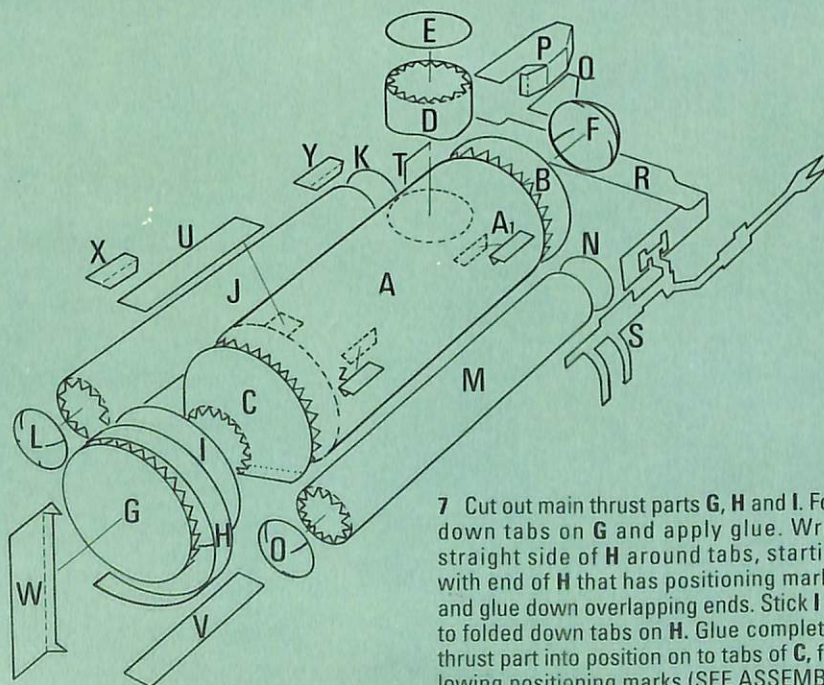
1 Cut out sonar parts **P** and **Q**. Fold **P** to shape and spread glue on tabs. Stick **Q** on to tabs to form box-like structure with extension on top. Glue extension on **P** to **A**, following positioning marks.

2 Cut out fender **R**, fold and glue into position on **J** and **M**. Cut out mechanical claw **S** and also glue to **M**, again following positioning marks.

3 Cut out **T** and glue to left side of rear end of **A**, following positioning marks.

4 Cut out rudder parts **U**, **V** and **W**. Fold down tabs on **W**, then glue one tab to underside of left corner of **U** (end furthest from positioning dots) and the other to underside of right corner of **V**. Stick **U** to top side of **A**, and **V** to the bottom of **A**.

5 Cut out hydroplanes **X**, **Y**, **Z** and **A1**. Fold down flaps and glue into position on main body **A** (SEE ASSEMBLY DIAGRAM).



7 Cut out main thrust parts **G**, **H** and **I**. Fold down tabs on **G** and apply glue. Wrap straight side of **H** around tabs, starting with end of **H** that has positioning marks, and glue down overlapping ends. Stick **I** on to folded down tabs on **H**. Glue completed thrust part into position on to tabs of **C**, following positioning marks (SEE ASSEMBLY DIAGRAM).



PROJECTS

THE SEAS

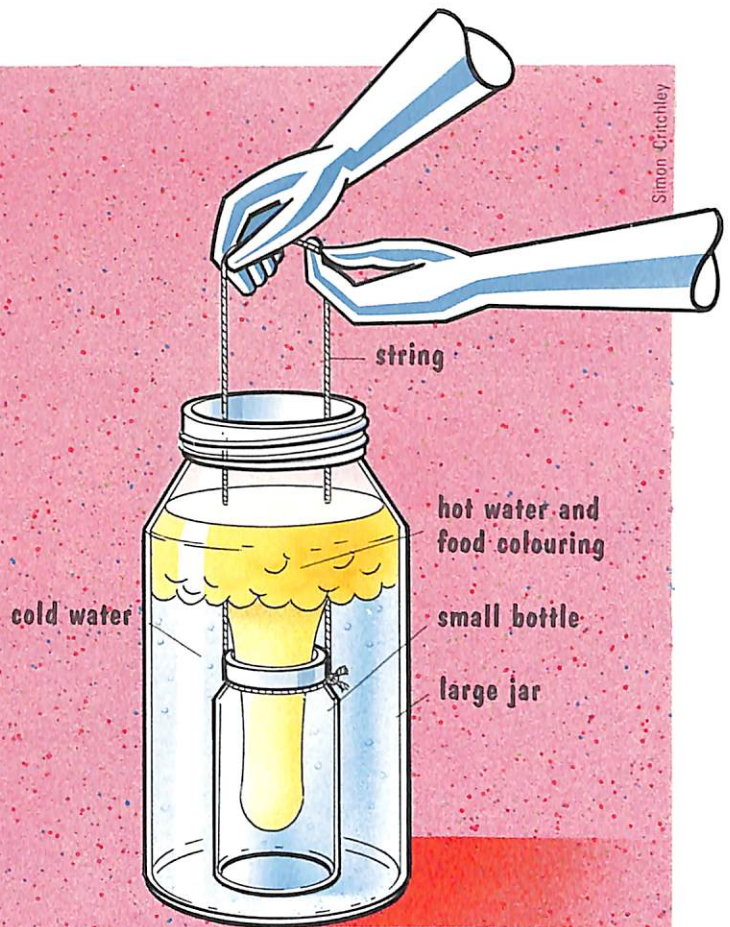
How can you make an underwater fountain with two bottles?

UNDERWATER FOUNTAIN

1 2 3 4 5

When water is heated, it expands. Hot water coming into contact with cold water will rise above the colder liquid.

You need a large jar or glass bowl, a small bottle with a narrow neck, a piece of string roughly 30 cm long and some food colouring. Fill the large jar with cold water. Tie the string securely around the neck of the small bottle so that you can lower it into the jar without tipping it over. Now fill the bottle with hot (but not boiling) water and stir in a little colouring. Slowly lower the bottle into the jar or bowl until it is submerged in the cold water, being careful to keep it upright. Coloured hot water will gush out of the bottle and rise to the top of the larger jar, until it is floating on top of the cold water.



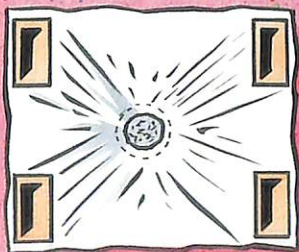
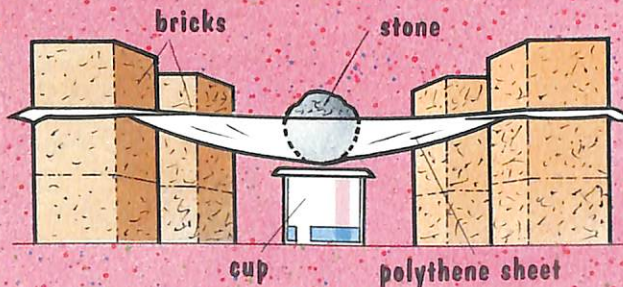
Simon Critchley

ADVENTURES IN THE WORLD OF SCIENCE

COLLECTING WATER

1 2 3 4 5

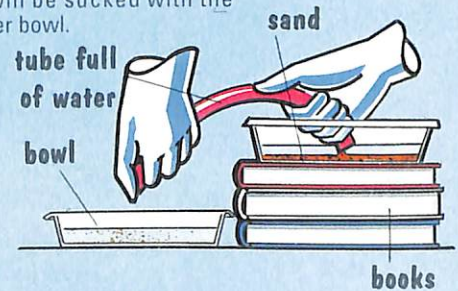
You need a sheet of polythene measuring about 2 x 2 metres, 12 bricks, a small stone and a cup. Arrange the bricks in four piles about 1.5 metres apart, as if they were the corners of a square, and place a cup on the ground where the centre of the square would be. Wedge the corners of the polythene between the second and third bricks in each pile, so the sheet is suspended above the cup but not touching it. Place the stone on the sheet, directly above the cup. After a few hours on a hot sunny day, you will find that water has condensed on to the polythene and dripped down into the cup. This is a good way of obtaining water in the desert.



WATER VACUUM

1 2 3 4 5

You need two bowls, a few books or bricks, a plastic tube about 50 cm long, water and sand. Fill one of the bowls with water, then pour in some sand. Place this bowl on the books or bricks so that it is 10 cm or so off the floor. Place the second bowl on the floor, beside the first one. Put one end of the tube into the water in the first bowl and suck the water up the tube. When the tube is full, put your thumb over the end to stop any water escaping, place the end in the lower bowl and take your thumb away. The water will continue to flow from the upper bowl. Use the tube as a vacuum, moving it over the sand. The sand will be sucked with the water into the lower bowl.



PROJECT INFORMATION

1 2 3 4 5

Each **QUEST** project and model has its own difficulty rating: 1 very simple, 2 simple, 3 intermediate, 4 advanced, 5 complicated.

WARNING!

Every care has been taken to ensure projects are as safe as possible. However, parents should supervise all projects. The publisher can accept no liability for injury.